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A MODEL FOR MERGING INFORMATION SYSTEMS: A CASE STUDY OF THE AIR FORCE MATERIEL COMMAND MERGER

THESIS

John A. Ellis, Captain, USA
Matthew T. Pirko, Captain, USAF

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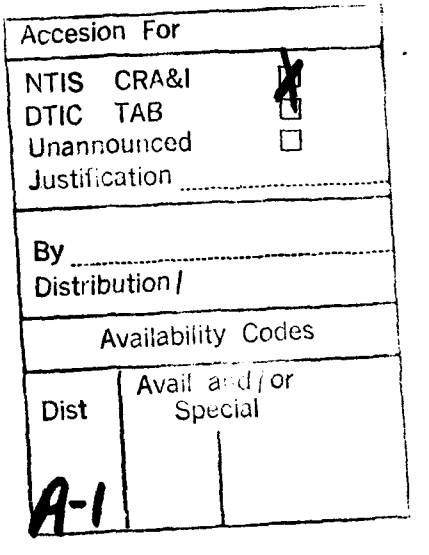

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THESIS

Presented to the Faculty of the Graduate School of Logistics
and Acquisition Management
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Master of Science in Information Resource Management

John A. Ellis, B.B.A.
Captain, USA

Matthew T. Pirko, B.A.
Captain, USAF

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Preface

The purpose of this study was to develop a theoretical model that could be used by managers and planners for merging information systems as part of an organizational merger and to compare this model with those actions that took place within an actual merger.

Individuals involved in the planning and implementation of those merger plans were interviewed and their responses compared to the aggregate theoretical model. A qualitative analysis was conducted on the responses of the interviewees in an attempt to understand the implications of individual merger activities between various organizations. This research provided support for the aggregate model. Future research should continue to develop and refine the model and develop a more in-depth template for merging information systems under various circumstances.

We had a great deal of help writing this thesis and obtaining interviews for our study. We are especially thankful to our thesis advisors, Major Robert E. Pappas and Lt. Colonel Mark A. Roth, for their patience, guidance, constant encouragement, and the *"pencil of death"* . We would also like to thank the Air Force Materiel Command, Wright-Patterson AFB, personnel for their honesty, time, support, and interest in our research. This research would have been a great deal more difficult if had not been for the support of our sponsors, SAF/AQK and the Army DISC^4 IMA

offices. Most of all we would like to thank our friends and family for their tolerance, support, and understanding throughout the entire thesis process.

John A. Ellis Matthew T. Pirko

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Abstract

As the Department of Defense continues to shrink, "downsizing" and "rightsizing" are terms that often indicate that changes are inevitable to many military units and organizations, some of these changes result in organizational mergers. One of the critical areas for such mergers lies within getting the information systems of the pre-merger organizations to work together. This thesis presents a model for merging information systems as part of an organizational merger. The proposed model, synthesized from existing technical and non-technical models and guidelines, addresses five key areas for consideration for a successful information systems merger. Those areas are:

1) Organization Structure
2) Information and Data Flow
3) Cultural Factors
4) Common Technologies
5) Common Goals

A case study of the Air Force Materiel Command merger was examined to test the model and to comment on the results of their efforts for future merger activities.

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I. Introduction

General Issue

"We did a lot of checking, and then everybody held their breath," said Ronald Tober who is the director of management information systems (MIS) for the merged company Outokumpo American Brass Inc., of Buffalo, NY. (Sharp, 1993: 71). The quote reflects the frustration among MIS workers and managers when it comes to coping with the effects of corporate mergers. What is the basis for this frustration? It is the lack of planning that becomes apparent as attempts are made to merge potentially disparate information systems, after a merger has occurred between organizations.

Why has information and MIS moved into such an important area of interest? A paper by John Henderson and N. Venkatraman describes the issue:

> It is clear that even though information technology (I/T) has evolved from its traditional orientation of administrative support toward a more strategic role within an organization, there is still a glaring lack of fundamental frameworks within which to understand the potential of I/T for tomorrow's organizations. (Henderson and Venkatraman, 1993: 4)

Information technology, "the hardware and software used for...information, regardless of the technology involved..." (DoD directive 8000.1: 2.2) is the technical orientation of MIS, and is therefore germane to the overall discussion of MIS. MIS have become part of the overall business strategy for organizations. An organization that intends to succeed will need to be rooted in a firm, overall, organizational strategic plan (Zwass, 1992: 418-20). Some authors have even suggested that information is the primary link between a company's MIS strategy and the business strategy (Glazer, 1993: 100). A company formulates its individual strategy which then becomes the overall framework for the future. Consequently, organizational mergers attempt to combine the strategies from two different organizations into one.

Organizational mergers have become almost commonplace in the corporate world as organizations struggle to compete during a period of economic sluggishness, and increasing awareness on the part of the consumer that customer service and quality are now required, not an afterthought. For example, in 1992, the number of merger and acquisitions valued at over $1 million was at 4,749, and their overall value was at roughly $130 billion. So called "megadeals," those deals valued at over $1 billion, numbered 17 (Woolley, 1993:36). Balancing profit and outstanding customer service has led many organizations to look toward other units as partners in maximizing both factors. Whether they are large in size and implication, such as the merger between National

Cash Register (NCR) and American Telephone and Telegraph (AT&T), or rather small in scale, the result usually means a better overall position for the post-merger organization. Without some impetus for improvement as a relevant factor, the merger would not have been suggested and implemented (Green, 1993: 25).

When organizations merge, much time and effort, not to mention money, is spent simply on planning for the merger and designing the structure of the resulting organization. This planning encompasses many different aspects; from physical design of the new organization to how the new organization will structure itself to operate in the market. After a projected merger is announced, a team of specialists is sent in to learn as much as possible about every aspect of each organization's operations in order to formulate plans for how to bring the pre-merger organizations together (Green, 1993: 28). Included in this understanding is how the people will be affected, how the different "systems" will work, and how to bring them together to reach the joint organization's goals and desires for future success (Sharp, 1993: 71). Integrating this with the above stated arguments, companies have become more conscious of the value of another aspect of this planning, their information and information technology assets, and the DoD is no exception.

Background

The way to tie information and the information technology assets together is to describe them in terms of a generic definition. For this research, the common term used is management information systems. An MIS is "...an organized portfolio of formal systems for obtaining, processing, and delivering information in support of the business operations and management of an organization" (Zwass, 1992: 6). In this research, the phrase "information system" (IS) will be interchangeable with MIS, and is defined the same. MIS are employed in business by using the term "information management." Information management (IM) is defined by Department of Defense (DoD) Directive 8000.1 as:

> The creation, use, sharing, and disposition of data or information as corporate resources critical to the effective and efficient operation of functional activities consistent with the guidance issued by the C^3I . It includes the structuring of functional management improvement processes by the OSD (Office of the Secretary of Defense) Principal Staff Assistants to produce and control the use of data and information in functional activities; information resources management; and supporting information technology and information services. (DoD Directive 8000.1: 2.1)

The management of information has become so crucial to organizational effectiveness and success that the DoD has established new, specific guidelines and structures to deal with the subject. Through the Corporate Information Management (CIM) initiative, established by the former

Director of Defense Information, Paul A. Strassman, the DoD has empowered the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD, C^3I) to create a Defense Information Manager (DIM) responsible for the overall implementation of the above stated definition. Through the auspices of the Defense Information Systems Agency (DISA), the DoD is attempting to control the numerous, varied systems, data, and information that exists in the DoD. CIM has become so important that the entire upper echelon structure of the DoD has endorsed it:

> They are interested in making CIM an integral part of the infrastructure of the DoD, as an enduring element of the changes that the DoD must experience as the missions of defense change. (Strassman, 1992: 12)

How does information management relate to organizational mergers? According to many sources, it is an inseparable part of the merger effort. According to Doug Van Kirk, senior editor at Infoworld, "As companies are merged or taken over, their assets are consolidated as well, and nowhere is this more evident than in information systems departments around the country" (Van Kirk, 1993: 52). This research suggests that organizations should, as a part of their overall pre-merger activities, actively stress the combination of information and information systems. If combining organizations defer post-merger integration and management of information systems until the last minute, they may be missing one of the most valuable elements in the

process and creating a formidable handicap to their organizational success (Calabrese, 1991: 25).

Including information systems mergers in the overall merger effort may seem like an obvious observation; however, with only one notable exception, this has not been the case. Instead, organizations typically press forward with merger activities, getting caught in the euphoria surrounding the overall combination. They do not consider, at these early stages, what impact the potentially (and historically) different information systems will have upon the future effectiveness of the new organization as borne out of the merger (Calabrese, 1991:25).

If these information systems issues are examined or addressed after the merger, they often impact the workload and effectiveness of the organization (especially the information managers...), and can even adversely affect the bottom line. On the technical side, after the merger, Van Kirk addresses this problem:

> In an effort to make the transition go as smoothly as possible, some acquiring organizations spend too much time and money maintaining outdated or poorly designed systems. When California's Bank of the West acquired that state's Central Bank, it was initially excited about the technology the buyout would bring. But (their) team soon discovered that much of the equipment had not been maintained and many systems were teetering on the brink of failure. Bank of the West ended up spending significant funds to repair Central's systems and keep them working. (Van Kirk, 1993: 56)

This does not imply that all experiences of post-merger information systems integration have been this costly or

negatively impacting. However, most authors recognized that prior planning would have significantly aided the transition and prevented future problems. ABC Radio, who combined with Satellite Music Networks in Dallas, Texas, did not plan their merger. The leader of their effort, Jasmine Alexander, indicates some of their lessons learned. "More planning...If we didn't have to do it so fast, we would have had more time to research the products and find their limitations" (Mehta, 1993: 131). She further indicates that this would have avoided some of the costly incompatibilities she and her team uncovered (Mehta, 1993: 131).

Within the DoD, this same phenomenon appears evident as attempts are made to incorporate numerous, scattered data centers into 15 "megacenters." The leaders of this change recognized that planning "on the fly" just doesn't work well (Endoso, 1993: 57).

Specific Problem Statement

The purpose of this research was to develop and test an aggregate theoretical model for use when integrating organizational MIS during the planning of organizational mergers. The model was not limited to expressing DoD-exclusive material or implication.

This study was initiated to: (1) review existing theoretical models for merging, and acquisition of, organizations; (2) establish an aggregate theoretical model consisting of common implementation elements for merging MIS

within the DoD and potentially within civilian organizations; and (3) compare the aggregate theoretical model to actual MIS merger activities in a merged (military) organization.

Development and testing of an aggregate theoretical model for use during organizational systems mergers appears to be a needed refinement. Numerous authors have suggested that such a model may be necessary for all future mergers. The importance of information systems in a merger warrants further research and understanding, especially in the light of restricted budgets and manpower decreases (Clemons, 1992: 211).

Investigative Questions

- What is the aggregate model? What are the key perspectives and variables involved?
- To what extent did the case study organizations' experiences reflect the aggregate model?
- What variables need to be added to/deleted from the aggregate model?
- What lessons have the organizations learned during their merger efforts which would have future impact?

Operational Definitions

Mergers are unique activities--each has its own set of parameters, goals, and methods. The range of merger types

runs from the outright purchase or acquisition of an organization to a merger or integration. These two ends of the spectrum are applied differently, yet they both accomplish the same overall goal of bringing two or more organizations together.

An acquisition usually occurs when one organization purchases another; this activity may be congenial between the separate parties or it may constitute a hostile takeover of one organization by another. Bank One of Ohio has been very successful in purchasing individual banks from around the state of Ohio and integrating them into the Bank One system. These acquisitions are intended to expand the customer base and overall financial strength of Bank One. A source within the Bank One Corporation Conversion Services indicated, "There is never any doubt of who bought who and who is driving the train." With this in mind, acquisition planners may not be as concerned with the cultural and personal needs of the acquired organization.

An acquisition is usually initiated to expand the financial base of at least one of the organizations. In these actions, one of the parties is the driving force behind the acquisition and will determine the direction of the newly formed entity. According to Van Kirk, "A decision is made in the board room and the combined companies are expected to eliminate duplication and apply economies of scale." Within these mergers, there are many decisions to be made. When Contel Cellular and GTE Mobile Communications

merged, "The decision to merge was based on business and financial issues, not systems concerns...However, as soon as plans are finalized, systems staff became involved"(Van Kirk, 1993: 52).

A merger or integration, on the other hand, generally comes about by the mutual agreement of two or more organizations to become one. These separate organizations each take part equally in the planning, organization, and implementation of any, and all, requirements needed to bring the organizations together. As such, mergers may consider the needs of the people who work with the systems to be as important, or more so, than the technical, financial, or other reasons for merging.

This case study focuses on the merger ,or integration, of two Air Force major commands, Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC) which became Air Force Materiel Command (AFMC).

Scope of the Research Topic

The chosen case study format led to several limiting factors when analyzing the mergers of organizational information systems after an organizational merger. An aggregate model was formulated from several existing models and non-model guidelines. This model was then used as the basis for analysis of merger activities within a recently merged organization. As the research continued, the fact that each merger is unique in its characterization became

apparent, thus it was reasoned that this study has only limited generalizability. Employees were interviewed from Air Force Material Command (AFMC), Wright-Patterson Air Force Base, Ohio, to assess the validity of the aggregate theoretical model regarding merging information systems as a result of their own organizational merger.

Conclusion and Overview

This research demonstrates the need and lays out current thought regarding information systems in conjunction with the planning required for integrating information systems as a result of an organizational merger. The need has been established by linking the information systems merger to the overall strategic and business plan that an organization wishes to follow after the separate entities have joined.

Chapter Two of this research reviews the relevant literature to support the original purpose regarding the need for, and structure of, an information systems merger model. It was determined that the proposed model appeared to have external validity because the consideration areas of the model were general enough to be applied in virtually all information systems mergers. The third chapter explains the research method used. Appendix A contains the actual instrument and a series of personal interview questions. The fourth and fifth chapters contain an analysis and discussion of those findings from the case study interviews.

II. Literature Review

Overview

The purpose of this literature review is to give the reader an overview of the major issues related to the topic of information systems mergers. Since the purpose of the overall research is to formulate a model for use by organizations considering a merger action, the literature initially discusses the need for a model, then formulates the model variables. There are limited general models available that address some of these areas; in addition, to construct a model, a synthesis of relevant elements from managerial and technical articles was accomplished. The literature review will explain key terms, give a brief justification, look at several theoretical models, and some non-model guidelines.

Explanation of Key Terms

The main term used throughout the literature is "information system." An information system is defined in Department of Defense (DoD) Directive 8000.1 as, "The organized collection, processing, transmission, and dissemination of information, in accordance with defined procedures, whether automated or manual (DoD Directive 8000.1: 2-2).

For the purposes of this review, we will also define several other information system-related terms. Information technology is, "The hardware and software used for

Government information, regardless of the technology involved, whether computers, communications, micrographics, or others" (DoD Directive 8000.1, pg. 2-2). When the research discusses mergers, the definition used will be, "...a merging; specifically, a combining of several companies into one" (Webster's New World Dictionary, 1977: 286).

Information management is defined as, "The...creation, use, sharing, and disposition of data or information as corporate resources critical to the effective and efficient operation of activities..." (DoD Directive 8000.1: 2-2).

Justification of the Search and Review

Various authors have indicated that a crucial step is missing when considering the merger of corporate information systems during an overall organizational merger. The missing step is the information systems implementation planning phase, which is considered by many to be necessary before the merger takes place. However, the planning phase has been forgotten in the haste to merge the organizations and begin the profit-motivated organization (Van Kirk, 1993: 52).

Effectively using the planning phase, and an overall model for information systems merger planning, means that organizations will be able to save money and effort in the long run. Currently, much time, effort, and money is being spent trying to align information systems after corporate

mergers take place. These are resources many organizations do not have in abundance (Mehta, 1993: 130). The federal government, and specifically the Department of Defense (DoD), realized that as a corporate entity, money is a dwindling resource and therefore cannot be spent on costly measures to align these systems. Through new business process improvement efforts, the DoD is trying to cut down on the differences between information systems which exist today (Strassman, 1992: 12). Planning for these mergers would reduce costs and allow the organizations to assess the true position they are in with regards to the equipment, talent, and money they have available for the future enterprise.

Theoretical Models

Understanding the need for prior planning when considering an organizational information systems merger, various managerial and technical change and integration models will be discussed. The first part of this discussion centers around theoretical models that are used for integration of technical and managerial issues related to information systems. The final part of the discussion highlights some guidelines provided for successful systems integration and management.

The Zwass Model. Zwass suggests that an IS infrastructure can be modeled at a high level through an information system architecture, which is defined as "a

general model of the desired structure of the organization's information systems." (Zwass, 1992: 12) Zwass goes on to indicate several key ingredients to what he considers an IS Master Plan. Paraphrased, the Master Plan is necessary to make an assessment of the technology barriers relative to the merging of organizations. The Master Plan addresses how an organization uses its IS, how it plans to make the most of its existing IS, and how to maximize its future capabilities to serve the organization (Zwass, 1992: 680).

The key ingredients Zwass deems as necessary include:

a) an assessment of the organizational context

b) an assessment of existing IS capabilities (the hardware and software issues)

c) an examination of IS alternatives in support of the organization's strategic plan

d) specifications for the future IS environment and of its major resources

e) an implementation plan for the Master Plan (Zwass, 1992: 680)

This model is useful since it specifically delineates how the technical side of an organizational information systems merger could be addressed.

Information Systems Architecture (ISA). The ISA model is a general model for the management of a systems integration program. Integration deals with the technical elements of an information system, as well as the business integration with the enterprise. This two-part model

addresses these two general areas. The management model defines the scope of the management process and its essential functions, including systems engineering and prototyping capabilities with a defined set of measures and metrics. The supporting ISA template is comprehensive in the business objectives covered, responsive to changes in the business and technologies, and useful in producing a practical information architecture. This management model, in concert with the ISA template can be applied to the definition and design of a newly established program, or as an audit approach for the existing program (Hoffman, 1992: 4).

The following are the steps to achieve the ISA model:

1) Define the business objectives
2) Develop the business workflow
3) Develop the systems requirements
4) Specify the applications and data architectures
5) Define the information infrastructure
6) Develop the systems integration plan
7) Develop the organizational plan to perform all defined program management functions
8) Define automation/information system program measures and metrics consistent with quality measures and emphasize processes as well as products
9) Determine staffing levels and training requirements for implementation and operation
10) Manage software integration using applications

clusters as the focus of responsibility

11) Manage the overall program to the measurable program objectives including business and system technical performance

12) Document the ISA and apply formal configuration management to the program

Strategic Alignment Model. This model was developed to address the planning concerns of managers and corporate planners in the emerging area of information technology strategic management. Information systems and technology within an organization can successfully be incorporated into the following areas:

1) Business strategy -- overall goals and direction of the organization

2) Information Technology Strategy -- overall goals and strategy of the information technology needs within an organization

3) Organizational Infrastructure and Processes -- the functional layout of the entity and its operating methods

4) Information Technology Infrastructure and Process - the physical configuration of the organization's IT assets, and their operating methods

The strength of this model is in its application for ensuring the alignment of information technology with the overall strategy, goals, and objectives of the organization (Henderson, 1993: 4-17).

Lewin's Change Model. The change model expressed here deals with the state which exists in a given organization (Figure 2.1). Once a change is advocated within the organization, the complete culture within an organization will, of necessity, change its structure. The way that Lewin suggests accomplishing this change is through a process that involves unfreezing the way the culture currently exists, movement toward the change is then accomplished, and finally, the organization refreezes its culture to incorporate the change.

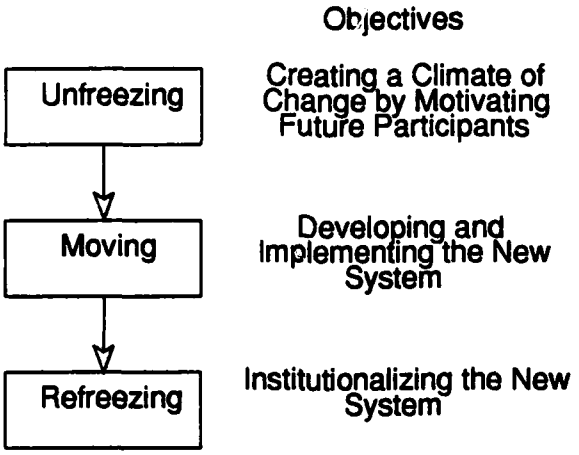

FIGURE 2.1. LEWIN-SCHEIN MODEL OF ORGANIZATIONAL CHANGE (ZWASS, 1992: 466)

Lewin's model is based on the theory that organizations continuously strive to maintain a steady state and require external pressures to initiate internal change. These external pressures could range anywhere from regulatory changes to business competition. Organizational change initiated by these pressures occurs at three levels:

individual, structural and system, and climate/interpersonal style. Each level requires different change strategies and techniques (Goodstein and Burke, 1991:10). At the individual level, skills, values, and attitudes must be changed. These changes may eventually lead to positive changes in individual behavior. At the structures and systems level, reward systems, work design, reporting relationships, and other similar characteristics are changed. At the climate/interpersonal style level, conflict, personal openness, decision-making methods, and other activities are managed (Goodstein and Burke, 1991:10).

Non-Model Guidelines. Much of the literature written about implementing new technologies, while not defining theoretical models, produces many useful guidelines for installing new technologies in organizations. One such piece of literature is presented by Corbitt and Norman (Corbitt and Norman, 1991). The authors cite three strategies for dealing with technology implementation: power-coercive, rational-empirical, and normative-re-educative (Corbitt and Norman, 1991:639).

The power-coercive strategy involves the use of authority and power to force people into using the new technology. Normally associated with this strategy is a negative effect. For instance, any user who does not effectively use the new technology after a certain time may be fired. This strategy will, undoubtedly, "increase worker productivity within a very short time, but at the same time

may create the most internal conflict for the individual" (Corbitt and Norman, 1991:639).

The rational-empirical strategy involves keeping workers informed about all aspects of the implementation, and they will rationally see that the results of the implementation will be to their benefit. Unfortunately, this strategy has approximately an eighty percent failure rate (Corbitt and Norman, 1991:639).

The normative-re-educative strategy involves working with people as groups and getting the group to put peer pressure on those who do not agree with the group. This strategy takes longer than the other two strategies, but this disadvantage is overshadowed by the advantages: worker development, worker satisfaction, worker productivity, and less internal conflict (Corbitt and Norman, 1991:639).

Additionally, the authors have compiled lists of common threads and critical success factors for successful implementation. These lists are presented in Tables 2.1 and 2.2.

TABLE 2.1. IMPLEMENTATION COMMON THREADS (Corbitt and Norman, 1991:640).

1. Manager and worker negative perceptions of change must be openly addressed.
2. Positive factors for change should be reinforced often.
3. Deal with highest stress first.
4. Change must start at top of organization.
5. Informal as well as formal lines of communication must be used.
6. All (or almost all) managers and workers should participate (or be represented) in process and design of organizational change, and not just be affected by it.

TABLE 2.2. CRITICAL SUCCESS FACTORS FOR SUCCESSFUL IMPLEMENTATION (Corbitt and Norman, 1991:640).

1. Client commitment to change (e.g., product champion).
2. Trust on part of management and workers.
3. Open communications.
4. Management commitment (e.g., financial champion).
5. Common view among managers and workers of implementation strategy.

CIM Integration Architecture. The CIM Integration Architecture provides a framework (Figure 2.2) that guides information systems implementation projects and also embodies the policies and principles that govern them. When this architecture is properly employed, each system that is developed can easily take its proper place in the information infrastructure and contribute not only to the business processes it supports but to the overall mission of the organization (Appleton, 1993:23).

The goal of the CIM Integration Architecture is to provide a consistent framework for all business process improvement activity that maximizes the value of investment in information assets; builds on existing geographic and technical Information Technology (IT) platforms; reduces duplication, harmful redundancy, and waste; and maximizes opportunities for distributed shared data applications that support defined business processes.

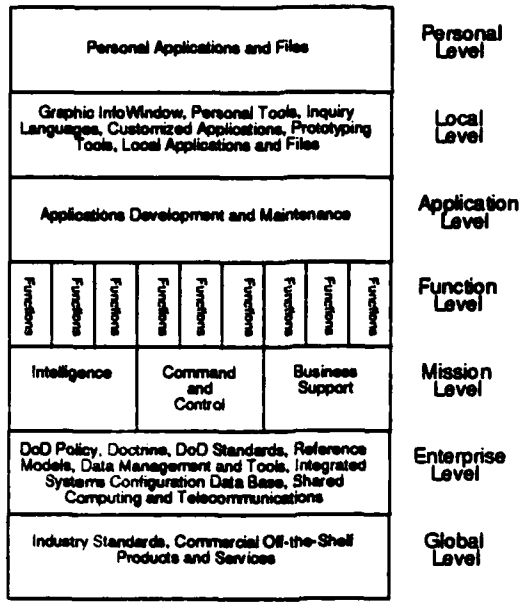

FIGURE 2.2 CIM INTEGRATION ARCHITECTURE (APPLETON, 1993:23)

The Global Level. The Global Level, the lowest or first level, reading the CIM Integration Architecture from the bottom up, contains the industry standards and commercial off-the-shelf (COTS) products and services that DoD incorporates into its infrastructure (Appleton, 1993:25).

The Enterprise Level. The Enterprise Level , which is the second lowest level of integration in the CIM Integration Architecture reading from bottom to top, provides the geographic, technological, and managerial platform upon which all information systems development activity is based; it is the foundation that must support

all that is built above it in the higher levels. This enterprise level is where policies, principles, methodologies, tools, and techniques are applied to information design and redesign and development. In other words, this level forms the baseline for all business process improvement opportunities involving technology (Appleton, 1993:26).

The reference models at this level include, among others, an IDEF1X model, which is a representation of the kinds of business rules that are shared among the numerous business processes in the organization. This level also contains the organization's actual business rules that represent the data constraints on the way the DoD conducts its business. Each organization must analyze its own objectives and management culture to be sure that they are consistent with the other components of the DoD Enterprise Level.

The Mission Level. The Mission Level contains the principal mission areas within each level of the organization. All decisions made in the previous level have their basis, and are measured against, the mission requirements of the entity (Appleton, 1993:27).

The Function Level. The Function Level contains the specific business processes that are derived from mission needs. All business processes exist to serve mission needs. If not, they are entirely unnecessary and should be eliminated. While business processes cross organizational

boundaries, the organization's structures must not be allowed to control business processes or constrain business process improvement projects and actions that are applied at the Function Level of the CIM Integration Architecture. As products and services move from the Mission Level to the Function Level, existing processes and organizational structures must be reviewed to determine if they are still capable of supporting mission requirements (Appleton, 1993:28).

The Application Level. The Application Level contains specific manual and automated procedures that exist to support business processes. It is at this level that most DoD resources and assets are deployed. All resources allocated to lower levels in the CIM Integration Architecture have only one justification--to maximize utilization of resources deployed at the Application Level. Any resources being expended at other levels that don't contribute to the support of the Application Level should be considered unnecessary overhead to be reduced and, if possible, eliminated. The transfer of data and information units within the Application Level is accomplished most effectively by distributed shared-data systems (Appleton, 1993:29).

As products and services move from the Function Level to the Application Level, they must be reviewed for optimum integration into existing structures in the Application

Level to avoid disruption of services, duplication, harmful redundancy, and waste.

The Local Level. The Local Level addresses customer support requirements involving integration with both the Application (one level down) and Personal (one level up) levels. Much of what is found in this level might seem to be application-oriented, hence belonging to the Application Level below. However, on that lower level, the concern is the development and maintenance of the applications resources. In the Local Level, those resources are used to directly support customer needs such as graphics, computer languages, prototyping tools, etc. (Appleton, 1993:30).

The Personal Level. The Personal Level refers to the level at which individual users interact at the desktop with the CIM Integration Architecture. At this level, personal privacy, individual choice, and personal preference are available at the desktop or workstation. At this level, the user sees the transparent operation of the entire CIM Integration Architecture, seamlessly meshed to insulate the user from the unique characteristics of individual systems at Application and Local levels (Appleton, 1993:31).

Proposed Model

The models expressed above contain certain characteristics which can be applied when synthesizing an aggregate model for information systems mergers. The point

most models and other literature sources agreed upon was the need to establish, then follow, a corporate business strategy, and accurately input the information technology into this strategy. Another point is that organizations should attempt to define their information needs. This can be done in several ways, and should be done prior to the actual study or planning for the physical hardware that accompanies the information system.

The literature reviewed suggests that the following elements should be included in a model for use in planning an organizational merger (Table 2.3):

A) Organizational Structure

B) Information and Data Flow

C) Cultural Factors

D) Common Technologies

E) Common Goals

As is evidenced by the above five areas, both technical and non-technical models and guidelines were required to develop the model. These general subject areas consider all aspects of merging information systems as part of an overall, organizational merger. The matrix (Table 2.3) indicates which models, or guidelines, contributed to each common element area.

TABLE 2.3. AGGREGATE MODEL MATRIX

Common Elements	Zwass Model	Information Systems Architecture	Strategic Alignment Model	Lewin's Change Model	Non-Model Guidelines	CIM Integration Architecture
Organizational Structure	X	X	X			X
Information and Data Flow		X	X			X
Cultural Factors				X	X	
Common Technologies	X	X	X			X
Common Goals	X	X	X		X	X

Each of these areas considers various aspects of an information system merger. They are defined as:

Organizational Structure. The organizational structure component describes the information systems that existed before the merger and breaks them down into their separate components. The decomposed systems may then be compared to one another to look for redundancy in effort and structure. The key goal of this area is to look at how the pre-merger organizations are structured, so that the post-merger organization will not waste resources on redundant systems and departments (Appleton, 1993:28; Hoffman, 1992:5-6).

This area also identifies internal benchmarks that represent the best ways of doing business within the post-merger organization. By breaking the current pre-merger systems into their organizational parts, planners should be able to find the best practices that are taking place in certain parts of the organizations and export them from those pockets throughout the entire organization (Henderson, 1993:5). This area may also create some tension within the post-merger organization in that the small "fiefdoms" that are present within organizations may no longer exist after the merger thus creating some degree of resistance to change (Zwass, 1992:679).

Information and Data Flow. Once the systems are broken down into their components, the flow of information and data needs to be determined in order to ensure that the new, merged systems will be able to provide the same solutions to needs, at least as well as the previous systems (pre-merger). This consideration is very important to the acceptance of the newly formed post-merger information systems (Hoffman, 1992:6).

If the new systems cannot perform as least as well as the old systems, people may not use them at all, making it imperative for planners to understand the information needs of the organization. Data structure and standardization must also be examined to insure that the new post-merger

systems can get to the information that users will need to accomplish their tasks and assignments (Appleton, 1993:24; Henderson, 1993:4).

Cultural Factors. Cultural factors--perhaps the most important area for consideration--consider the acceptance of dealing with the newly changed organization and its information systems. This is why the previous area is so critical. If the new system cannot meet the needs and expectations of its users, then the ability of the newly merged organization to function effectively and efficiently is impaired due to a lack of use (through low user acceptance) of those systems (Zwass, 1992:466).

No matter how well the technical aspects of the post-merger organization's information systems work together, the people that work with those systems will determine if the merger is a success. People that have been with organizations for a long period of time often become attached to their way of "getting the job done". The expression, "that is the way we have always done business," may haunt the planners of the merger itself as a result of the potential changes to be brought about by the merger (Markus, 1983:430-444).

An assessment of the resistance to change must be made in order to understand the needs of the people within the organization, so that allowances for user input can be made for the people who will actually use the systems. User input into the planning of the merger may assist the

planners in overcoming some of the merger's potential problem areas. Planners must consider all aspects of the organizational merger, not just the merger of the information systems, that will have an impact upon the people of the affected organizations (Corbitt and Norman, 1991:639).

Common Technologies. Organizations must understand the technical requirements necessary for separate information systems to communicate with one another. Recent advances in technology have lessened the overall weight the common technologies area carries in the scheme of activities than it may have just a few short years ago. Nonetheless, the machines must still be able to communicate with each other and consideration must be given for those difficulties and the costs associated with accomplishing these tasks (Hoffman, 1992:10-11).

A thorough understanding of the applications software and hardware involved in the information systems merger will assist planners in determining the courses of action that are available in getting the pre-merger systems to work together and at what cost. The level of integration between the pre-merger systems can be directly influenced by this understanding. Whether the merger will result in fully integrated, partially integrated, fully separate, or fully incompatible systems must be determined and measured from technical and financial viewpoints (Appleton, 1993:25; Henderson, 1993:4-16; Zwass, 1992:679-680).

Common Goals. In order to make the overall merger (organizational and IS) a success, the participants within the merging organizations need to understand the direction of the newly merged organization. Without common goals, the organization can have no impetus for success (Appleton, 1993:11; Zwass, 1993:679-680).

By establishing a common direction, merger organizers can plan for ways to overcome the problems that will arise within the other four areas of consideration. This commitment for the post-merger organization must come from the top of the organization in order for the participants to accept the changes that are to take place. Planners must secure the endorsements and involvement of the pre-merger organizations' leaders in order to establish the organizational buy-in required to make the merger a success (Harrington, 1991:27-28; Henderson, 1993:5).

Chapter Summary

This chapter explored the literature related to merging information systems. Overall, sources that were directly related to this area were limited. Thus, it was important to draw upon sources from other disciplines in order to deal with the various aspects that may be considered in order to merge disparate systems into one.

Several models were discussed, Table 2.3 shows how each contributed to a proposed aggregate model which was constructed from five common element areas of influence or consideration.

Overview of Chapter III

The next chapter provides the research design and methodology used to determine the feasibility and validity of the proposed aggregate model. The steps, necessary to answer the investigative questions as presented in Chapter I, are provided in the next chapter.

III. Methodology

Introduction

This chapter describes the procedures used in the collection and analysis of data required to answer the investigative questions posed in Chapter I. These questions are derived from the research objective of examining a recently merged military organization to determine to what extent the proposed aggregate model reflected those considerations that were used when the organization underwent its own organizational, information systems merger.

Specific Problem

In recent years, the Department of Defense has continuously reshaped and resized its organizations. Part of that reorganization has dealt with the merging of disparate information systems. Several models, discussed in the literature review, have been developed that address particular portions of the considerations for merging information systems. Through careful examination of these theoretical models, a model for future organizational information systems mergers within the DoD and other Services/Agencies was formulated. The purpose of this research was to develop an aggregate model and examine the model's efficacy in explaining relationships in organizations that have undergone organizational and information systems mergers. In addition, this research considers the role of the model on new merger actions.

A recently merged organization served as the basis of comparison with the aggregate model. As stated above, the DoD is constantly undergoing downsizing and right-sizing efforts in order to make its organization more effective. This study examined Air Force Material Command's post merger activities and focused on ongoing merger/integration efforts.

Investigative Questions Methodology

The core of this formal, descriptive research was the methodology by which the research was conducted. The remainder of this chapter details the steps necessary to answer the research and investigative questions. Each of the following research and investigative questions were addressed separately.

1. What is the aggregate model? What are the key perspectives and variables involved? A thorough literature review of applicable technological and cultural implementation models was presented in Chapter II. Each model was summarized. Once the models were analyzed, the key variables and characteristics of each model were identified. Next, the significant implementation elements were extracted and formulated into an aggregate information systems merger model.

2. To what extent did the case study organizations' experiences reflect the aggregate model? How did the merger

activities at AFMC represent the aggregate information systems merger model? Were the variables of the model considered by AFMC personnel when they merged organizations/information systems? What were the consequences/results? These questions were answered through face to face interviews conducted at AFMC Headquarters, Wright-Patterson AFB, Ohio.

3. What variables need to be added to/deleted from the aggregate model? What elements, if any, were incorporated in the case study information system mergers, but were not included in the aggregate theoretical model? As part of the questionnaire, respondents were asked if there were any additional factors that were considered in their merger activities.

4. What lessons have the organizations learned during their merger efforts which may have future impact? Those implementation elements identified by the consensus group at AFMC which were not part of the aggregate model, but affected the success of the implementation, are identified and discussed in Chapter IV and implications discussed in Chapter V.

The first investigative question was answered through the literature review, Chapter II. The remaining questions were addressed through the case study research method.

Research Design

There were several research methods available for this thesis. These methods include experiment, survey, archival analysis, history, and case study. A summary book on case study methodology by Robert K. Yin suggests that there are three conditions for determining the proper fit of a research strategy (Yin, 1989). "These three conditions consist of: the type of research question posed; the extent of control an investigator has over actual behavior events; and the degree of focus on contemporary as opposed to historical events" (Yin, 1989:16). These conditions are shown in Table 3.1.

The case study research method was preferred to other research methods such as experiment and survey, because of the nature of the second investigative question. Yin, identified case study as the preferred method when "a how or why question is being asked about a contemporary set of events, over which the investigator has little or no control" (Yin, 1989:20). Case studies place more emphasis on a full contextual analysis of a limited number of events or conditions and their interrelations (Emory, 1991:142). Since the nature of the second research question involved how the organizations' merger activities represent the aggregate information system merger model, a case study was the preferred alternative.

TABLE 3.1. RELEVANT SITUATIONS FOR DIFFERENT RESEARCH STRATEGIES (Yin, 1987:17).

Strategy	Form of Research Question	Requires Control Over Behavioral Events?	Focus on Contemporary Events?
Experiment	how, why	yes	yes
Survey	who, what, * where, how many, how much	no	yes
Archival Analysis	who, what, * where, how many, how much	no	yes/no
History	how, why	no	no
Case Study	how, why	no	yes

* "What" questions, when asked as part of an exploratory study, pertain to all five strategies.

In addition, the researchers had no control over the behavior of the events because the merger events being studied had already occurred.

This study was limited in scope to a specific organization which had a limited set of parameters open to study. A case study as defined by Yin is as follows:

> A case study is an empirical inquiry that: investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. (Yin, 1989:23)

This research parallels Yin's definition of a case study. An aggregate theoretical model of information systems

mergers was compared to an actual organizational merger. The connection between the aggregate theoretical model and actual merger activities of the merged organization required qualitative analysis.

Finally, several sources of information, such as a literature review, structured on-site and off-site interviews, and on-site observation of the merger's effects were recorded and analyzed.

Quality of Research Design. The quality of a research design can be judged according to several logical tests. These tests include construct validity, external validity, and reliability (Yin, 1989:40). Construct validity involves the establishment of correct operational measures for the concepts under study. External validity concerns the domain to which the study's findings can be generalized. Reliability demonstrates that the operations of the study can be repeated with similar circumstances (Yin, 1989:40-41).

Another test to assure a quality study is content validity. Content validity is the extent to which a measuring instrument provides adequate coverage of the topic being studied. Basically, if the instrument contains a representative sample of the universe of subject matter of interest, then content validity is good (Emory, 1991:180).

Content validity was ensured by allowing key informants to review the proposed aggregate model and the survey instrument. Through interviews with key representatives from Conversion Services, Bank One Corporation; the Center for

Integration, Defense Information Systems Agency (DISA); and the US Army, IMA Integration and Analysis Agency, it was determined that the proposed model appeared to have external validity because the consideration areas of the model were general enough to be applied in virtually all information systems mergers.

Reliability was considered to be problematic since every merger is a unique occurrence. In other words, repeatable results would be nearly impossible to achieve unless the original organizations were considered in future studies.

Survey Instrument. The next step involved the case study analysis of the information systems mergers at AFMC. The nucleus of this analysis was the development of a structured survey (see Appendix 1) to ascertain to what extent these merger activities matched the implementation elements of the aggregate information systems merger model. The structured interview consisted of questions reflecting the aggregate model implementation elements. Open-ended questions were used to address responses. The completed questionnaire was pre-tested at Wright-Patterson, AFB with AFMC/CI and AFMC/CIX personnel . The comments resulting from the pre-test with AFMC were incorporated into the structured interview instrument.

Survey Population. The case study involved personnel who dealt with the merger of the former AFSC and AFLC that merged into the Air Force Material Command on 1 July 1992. The interviewees participated in the writing and

implementation of those plans that formed the merged command. AFMC was formed primarily to bring together the Air Force's research and development and logistics capabilities under the same command. This combining of acquisition, maintenance, logistics, and research and development functions into one command was an integral part of the shifting of the Air Force's focus onto total systems management and the use of the Integrated Weapon Systems Management (IWSM) approach to weapon systems development and lifecycle management. Because the prior commands, AFSC and AFLC, each had separate information systems which had to be integrated at different levels and because the merger of AFSC and AFLC was planned for and agreed to by both parties, it was a suitable candidate for testing the model.

The questionnaire was administered through personal interviews at AFMC Headquarters. The target population for the structured interviews was the experts, managers, and workers working in the department or division within AFMC which most closely represented information systems application, development, maintenance, and management. Thus, the scope was limited to the viewpoint of those with a previous understanding of the old and new systems and organization. Eleven interviews were conducted.

Sample Population. With assistance from personnel within AFMC, an initial group of respondents was formed. The interview, and the respondent list, was shown to AFMC/CI leadership. Once the project was approved by AFMC/CI

leadership, more names were added to the list. Prior to conducting actual interviews, the survey was pre-tested by two recent AFIT graduates and one senior enlisted member of AFMC, thus ensuring its content validity. Their feedback was used primarily to refine the basic questions and assure follow-up questions were considered during the interview process. The interviewees were contacted and the interview process began. The people interviewed were all involved in some way in the merger of the two commands, especially where either information systems were concerned, or with the Office Automation issue (a local area network for the entire Headquarters element) within the new command.

Their involvement ranged from being part of the provisional headquarters set up for establishing AFMC, to working as integration team members. Most of the interviews took between 45 minutes and 90 minutes, depending on the level of involvement of the interviewee and the amount of information they were willing to provide. Anonymity was provided for all respondents.

Analysis. Once the interviews were completed, the qualitative information from the interviews was descriptively analyzed to determine if the perceptions of the sample interviewed supported the aggregate implementation model proposed by this thesis. The information was descriptively summarized by interview group and aggregate model elements.

Descriptive differences between the various respondents for each aggregate implementation element were investigated. This analysis is found in Chapter 4.

Chapter Summary

This chapter discussed procedures used in the collection of data required to answer the investigative questions. Using a case study methodology, an aggregate theoretical model was tested with a recently merged military organization. Testing the model, with an appropriate organization, as a tool for assisting in organizational information systems mergers in DoD organizations/agencies was offered as justification for choosing this case study analysis. The techniques and methodologies used to research, document, and answer each investigative question were provided. The primary methodology for addressing the theoretical technology implementation models was the literature review. The specific methodology for addressing the case study of AFMC's information systems merger was through personal interviews with the experts, managers, and workers involved in the information systems mergers.

Overview of Chapter IV

An analysis of the case study participants, and answers to the investigative questions are provided in Chapter IV. The main focus of the chapter is a presentation of the responses gathered during personal interviews. These responses form the basis of the discussion in Chapter V.

IV. Findings

Introduction

This chapter presents the responses gathered from personal interviews conducted during the period from 14 June - 5 July 1994. The questionnaire (Appendix A) was provided to each respondent prior to the interview. The questions address the five major areas of the aggregate model.

First, the composition of the interviewees will be presented. Next, the five areas of the model are highlighted using the stated questions from the survey as a guide. Finally, a brief conclusion explains the overall result. Each of the five areas from the aggregate theoretical model was examined through the responses gathered for each interview question. The observations are in a narrative format without additional analysis or interpretation. The original question asked is stated along with responses.

Group Identification

With assistance from personnel within AFMC, an initial group of respondents was formed. The prospective interview, and the respondent list, was shown to AFMC/CI leadership.

Information about the respondents follows:

- 10 males, 1 female
- 7 government civilians
  - -- 4 GS-15
  - -- 2 GS-14
  - -- 1 GS-12
- 2 contractor personnel who were retired Air Force majors
- 2 active duty Air Force personnel
  - -- 1 Major
  - -- 1 Senior Master Sergeant

Organizational Structure

1. What was the organizational structure prior to the merger (i.e. chain of command, process or function oriented, etc.)?

All respondents indicated that AFLC had a very centralized structure due largely to the way it allocated funds and the fact that it served standardized functions throughout the Air Force, primarily the depot maintenance of many aircraft, and logistics support for both weapons systems and the base structure. All respondents further reported that AFSC on the other hand was very decentralized. AFSC's structure was defined by the fact that the separate project offices all had their own 'money' (each was considered an independent business unit) and budgetary control. These separate organizations within AFSC performed

the same type of functions but with different means within the overall scheme of systems research and development, acquisition, and procurement. Each separate division, and then each separate program office within that division, was considered a business unit and conducted business without strong attachment to the headquarters function. One primary element to note was that AFSC dealt with contractors who had different and sometimes unique computer systems. As a program office linked to a given contractor, part of the contract outlined which computer system the office would use. This lead to many separate systems being incorporated. One other respondent indicated that money was a large issue when the commands merged. AFSC had a large amount of money available while AFLC did not. It was reported that AFLC was very fiscally conservative, while AFSC would "do the job first, paperwork later."

2. What organizational changes took place as a result of the merger? How did those changes affect your job (i.e. personally, information systems, etc.)?

One high-level respondent indicated that personnel within the new AFMC experienced heightened awareness of the functions on both sides of acquisition and logistics support. Individuals from each former command got a feel for the complexities involved in designing, acquiring, and sustaining a weapons system. Numerous changes reportedly

occurred in computer support from the aspect of centralized vs. decentralized control. AFSC used decentralized, non-standardized (throughout command) VAX mini-computers. AFLC used IBM/AMDAHL/etc. mainframes. HQ AFLC/IMU support services transferred to the Civil Engineers with the exception of IMUS which was transferred to Chief of Supply. One respondent working within the provisional headquarters indicated that the manpower ceilings imposed by the new command caused problems in getting things done. One respondent working in the information management function reported that a true information management research and development activity was established, but that the underlying processes and funding were not provided. One respondent from the former AFLC said that the merger planners forgot the function of the headquarters--to train and equip, and display leadership to the field.

3. What benefits/problems did the structure of the pre-merger organization have over the current structure?

One respondent indicated that a merger made sense, although with a concurrent reduction in force, he thought that expertise was lost since many civilians at AFSC headquarters did not choose to make the move. Under the new command leadership, the team concept of decision making became the norm. Mission Element Boards were established by command leadership to approach consensus board actions.

Most respondents reported in one form or another that one major perception problem existed then and continues today--concerning personnel assigned to key positions: old AFLC folks say old AFSC people are getting all of the important jobs in the command, AFSC vice versa.

Shortly after the command merger, many respondents indicated a second important information management issue was confronted. The merger of two functional communities, the Communications-Computers Division (SC) and the Information Management (IM) Division occurred. They merged into the Corporate Information or CI division. Reporting chains changed for the Materiel Systems Center (MSC) as they were assigned to Electronic Systems Center. Integrated Weapons System Management (IWSM) became the driving force for functional alignment. To add to the confusion inherent with any merger, the new Defense Information Systems Agency (DISA) was established under Defense Management Review Directive (DMRD) 918 as the lead agency for computer standardization and policy within the DoD. This directive and the new policies of DISA proposed to take many people and resources from each military major command, to include the new AFMC. Loss of key personnel (DMRD 918, drawdown, merger, etc.) also affected the level of support provided to customers. Network security functions were also affected.

Overall, AFMC continues to do the business contained within the old AFLC/AFSC, by the same parts of the

organization that always handled them. One interesting comment many of the respondents made indicated that the command has yet to define its overall mission. The command merger has been described as a merger of the HQ element only with the rest of the old functional offices still doing the same things they always have. Some respondents indicated that the current environment has a much slower decision making process when the MEBs are compared to the AFSC way of decentralized control of program offices. Most AFMC offices are still non-standardized from an information systems perspective. The current MSC computer community remains in a constant state of confusion. Old AFLC/SC was said to be more helpful to the command than the current AFMC/CI, since most customers are not sure what CI does or is intended to do for the command. AFLC appeared very weak on training opportunities; however, when the merger occurred, money and resources became available to increase the training opportunities. AFSC was more simplified in its systems than was AFLC, although AFSC displayed a great deal of redundancy.

Information and Data Flow

1. If "information needs" are defined as that information necessary to get your job done, was any organizational

identification of information needs accomplished before the merger took place? If yes, what types of identification took place?

When considering information needs planning, there is a wide range of perspectives--some say planning was completed, some say none was accomplished, and others are not sure. The functional chiefs were given an opportunity to do some planning and analysis in this area, but it was often viewed by the people collecting the data as a cursory examination. Each functional representative stated that the planning was being done, but in the view of the coordinator and provisional representatives, the work was not as fully documented and investigated as was necessary. Time apparently was a critical issue here; the perception by the planners was that the provisional command really had no idea of just how much effort it took to do this type of analysis. From the core business perspective, very little planning was accomplished since, as was pointed out earlier, the command did not and still has not accomplished an overall mission clarification. The command has a printed mission statement; however, many of the respondents were unclear as to what it was and how their job aligns with the mission.

2. "Data flows" are ways information and data gets from you to those people, offices, or organizations you interact with, along with the data actually needed to get the job

done. Was any analysis of this data flow done within either the pre- or post-merger organization? If yes, what sort of analysis was conducted?

Responding in a way similar to the previous question, most respondents indicated some data flow planning took place; often it was nothing more than functionals stating that whatever system they currently had was valid and necessary. In reality, no true data analysis as described in current Business Process Improvement literature was conducted. The Office of the Secretary of Defense in conjunction with the Air Staff drafted a work breakdown structure for the command that was to define a great deal of the commands' data/information needs. However, as many respondents pointed out, the functionals were never consulted as an integrated unit, only as separate entities. One respondent indicated that outside pressures, the DMRD, etc., caused many problems in identifying data. Under DMRD 918 for example, each base was to govern their own data while DISA would do everything else.

3. How much information and information system user involvement took place during the pre-merger activities? Were users consulted about their requirements within the new organization?

Many users within AFLC were expecting the Logistics Modernization Plan to take care of many of their information

system and standardization problems. With the advent of the merger, the plan was put on hold until an evaluation of the incoming systems could be accomplished. From a command viewpoint, the users of the command IS network were consulted, but it was a top down directed initiative. Outside of the headquarters, very little, if any, integration was initiated, thus there was very little user involvement in the merging of systems. This is a result of the separate functionals still doing what they have always done, with the exception of the HQ. One key individual was credited by many as seeking this type of information from the functionals and the various users throughout the command. But in speaking with the individual, it was clear these things were not accomplished; rather, the functionals reported through this individual's office regarding their systems and needs. One additional point is that when the headquarters developed an Office Automation (OA) workgroup to build a new system for the headquarters, the team used the system in place at the B-2 Systems Program Office as a template.

One respondent indicated that this implementation has led to hostility between the command and the base communications/computer group--this organization was not consulted and does not approve of the template even though it has previously been successful.

4. If no information relationship definition and/or data flow analysis was conducted, would such information have been useful for the actual merger implementation? How?

Only one person indicated that enough planning was conducted in this area. Everyone else agreed that something was done, to some degree, but that much more was really needed. One major disadvantage was that the command merger was announced on 3 January 1991 and was expected to be completed by 1 July 1992. After many years of merger rumor and speculation, the reality of a merger was never considered by most people in either command. Time was a critical component to getting the needed information/data analysis and time was in short supply. Many respondents were quick to point out that AFMC is still dealing with the fallout from the apparent lack of analysis in this area.

Cultural Factors

1. What is your assessment of the current cultural climate? What are the important workplace norms and values?

Two respondents directly indicated that the culture and climate within the command has been built amid insecurity. Downsizing, the merger, the various DMRDs, personal security, etc. have all had some effect upon the current cultural climate. According to the respondents, there are still many within the command who behave as either a "*Systems person*" or as a "*Loggie*". Some significant changes

have occurred, especially in the decision making process of the command, through the move towards supporting IWSM and the implementation of the Mission Element Boards (MEB). Many respondents say that there are no real changes outside of the HQ itself, with the two noted exceptions (IWSM and MEB). The numerous changes have resulted in a constant reassessment of personal norms/values. Loyalty and distrust ('us' and 'them') were mentioned by some as problematic. Respondents indicated that in spite of a provisional headquarters, reportedly built to encourage a new way of thinking, most relevant change issues were framed in a "former command" way of doing business. One respondent indicated that "lip service" is being played to quality as no one is really empowered to make decisions since decisions require fiscal authority. This authority, in his opinion, still resides with the leadership. One positive note was that command leadership was credited with doing a good job at "presenting a common culture."

2. What organizational cultural changes occurred as a result of the merger and its related activities?

As respondents indicated, there were some sweeping changes which the merger accomplished as some HQ personnel became the employees of field agencies, while the command focus shifted there as well. Within the new structure, the two major organizations from the former commands appeared to

go unscathed. Many respondents said that the basic structure went through little change outside the headquarters. Product centers experienced no real changes, and most of the Air Logistics Centers (ALCs) did not change either. The only noticeable changes were at the HQ level since the field agencies/functionals still do the same things as before the merger took place. Where management philosophy is concerned, MEBs and IWSM (see previous question) have been the biggest change areas. Some noted that the HQ is much stuffier and impersonal than it was in the past. AFLC used to conduct "dress down days" which were eliminated as the new command started. Training of personnel has also taken on new emphasis since at least two respondents said that adequate training money is now available. Strategic planning is now considered at the HQ level, but there seems to be problems as the strategic plan moves deeper into the organization; many indicated that this planning has not been fully accomplished. One of the leaders noted that during the last 6-8 months, dramatic changes have been noticed in the coming together of people being able to work more effectively together in that they are finally overcoming some of their personal prejudices (AFSC vs. AFLC), while others were not so convinced. One respondent indicated, "This was a shotgun marriage and it took time to settle down into a working environment conducive to teamwork."

3. Were any particular personnel concerns addressed as part of the pre-merger activities? (i.e. were any meetings or briefings held for the affected employees/users?)

All respondents acknowledged that briefings and meetings took place during the pre-merger activities to inform people as to what was going on. E-mail was also used extensively to get the word out, as were newspaper, bulletin boards, and flyers. Leaders promised to take care of people, and affected personnel were reportedly assured by this commitment. Even though all of this was happening, people were still worried about rating chains, positional assignments, discrimination (AFSC vs. AFLC). Given all of this, there was still some confusion evident from the responses. AFSC, since it was going to experience the greatest amount of change, took more interest in the personnel area. People at lower levels reported they observed many personnel, especially civilians, were still worried and confused by the planned changes ahead. AFLC personnel figured that they would not be as affected as their AFSC counterparts and generally ignored many of the larger personnel issues that were being generated by the merger. Some of the respondents indicated that the moves from Washington DC generated many problems, but many personnel simply opted to take other jobs in the Washington area, or look for other employment. This is how one respondent pointed to an apparent loss of expertise.

4. How would you personally assess the pre-merger levels of resistance to change within the pre-merger organizations? During the merger itself? Post-merger?

When discussing resistance to change, most respondents indicated at least some existed.

Pre-merger: Most say it was very high. One respondent said there was little initial resistance because people had no idea what was about to happen and that they thought the whole thing (merger) would go away. The rumors of a merger had been circulating for so long it was determined that the merger was never honestly going to happen.

During: Most respondents indicated that resistance was extremely high. A great deal of turf protection and survival reaction was evident throughout the command. People were very set in the way they had been conducting business. With only one exception, the reactions to change were labeled counterproductive. A major problem area was how AFSC viewed the AFLC IM functional areas. Combined with the earlier stated dichotomy between AFLC and AFSC personnel, there were still some divisions resisting change rather strongly.

Post-merger: Other respondents agree with an assessment by one of the leaders within the new IM structure when the individual indicates that resistance has pretty much diminished within the headquarters, although it still reportedly exists at the product center and divisional level

outside of the headquarters as changes continue to occur. Since the functions and missions in these locations have not changed greatly, as reported earlier, their acceptance of the new structure is either not as great, or not as impacting.

4a. At what level was leadership involved in the merger activities?

The commanders of both AFSC and AFLC conducted monthly joint briefings on progress and were separately briefed as needed. In creating a provisional headquarters, many of the normal decisions were made there. Two respondents also indicated the provisional headquarters was established to ensure that personnel within the commands understood an integration was occurring, not a takeover by AFLC. Several respondents indicated the provisional commander was someone who tried to recognize and organize the information systems perspective.

5. At what level were decisions concerning pre-merger activities made and who made those decisions? How were the merger decision details disseminated?

All respondents agreed that most decisions were made at the functional/divisional level (GS-15/O-6) based upon guidance from the Provisional HQ. There were a large number of briefings held by the leadership to ensure that the

P-Plan was being followed and thus decisions were made and disseminated from those meetings/briefings. One respondent indicated that some of the information was cloaked in secrecy due to political and personnel concerns. This appears to be an outlying response as the majority felt the proper people were making the decisions and most were well published. One comment often heard was that the intermediate leadership was still being parochial to preserve a job position until certain decisions were made; they then cooperated.

6. If no consideration was given to the cultural climate prior to the merger, what effect do you believe would have occurred with such consideration?

All stated that consideration was made for the cultural effects of the merger upon the command, but nearly all said that more could have been done, especially in regards to future activities. Teams were formed to provide various merger support activities, but their actions were not necessarily known to the command general public. "Lip service" was referred to more than once in regards to the activities that did occur. Time was once again a major issue. Some of the respondents indicated that Total Quality Management was present in both commands, but that it was not used as effectively as it could have to get the teams and the commands cooperating.

Common Technologies

1. What were the major hardware/software systems in place prior to the merger, and which systems were changed as a result of the merger?

One of the respondents indicated that before the merger, they were using many diverse systems; after the merger, most were still in place. Because AFMC functionals had a myriad of diverse missions, most of the respondents indicated that few changes occurred outside of the HQ itself. In fact, electronic mail is still not widely available because of incompatible systems. The HQ was the only place where full scale integration of systems was conducted. According to personnel assigned to the IM shops in each command, pre-merger AFSC was predominantly dependent on VAX mini-computers, pre-merger AFLC was still heavily using mainframe computers. Post-merger, they report that not much has changed. A project was in the works to improve the entirety of systems within AFLC. Talking to at least three of the respondents, this logistics modernization program was hailed as a system that would integrate the entire organization; however, when the Office Automation program mentioned before got started, logistics modernization was put aside.

2. At what point in the merging process were compatibility factors addressed? Who established the technology standards for the merged organization?

Provisional HQ leadership assigned working groups to look into these areas, but as noted earlier, a cursory examination of systems took place because functional personnel were reportedly hesitant to change their systems. Compatibility was addressed early on, but very little practical consideration was actually involved. One respondent indicated that compatibility was not really looked at, while deeper levels of integration and compatibility were virtually ignored. In reality, most respondents stressed that systems still cannot talk throughout the command.

3. Was a hardware and software cost analysis for merging the information systems conducted? By whom? Results?

Almost every respondent indicated that the work one individual did in this area was the main focus of the collective effort, but this person says that no real cost analysis was conducted. At the decentralized unit levels, no real changes occurred. The functionals were instructed to conduct full analyses of data and information but cost seems to have been left out. One respondent indicated that

the base signs indicating the change to AFMC were more important to leadership and management than the computer systems in terms of cost analysis.

4. What level of integration was decided upon between the pre-merger organizations? (full integration, partial, independent systems, or incompatible systems)

According to highly placed command the only area that was considered for full integration was the HQ itself. Because of the diversity of missions accomplished within AFMC, a great deal of independent and incompatible systems existed before, during, and after the merger. According to one former AFSC staffer, most personal computers (PCs) in the AFSC inventory were scrapped, while all 9600 baud modems and laser printers were reused. This was due to the configuration needs of the proposed AFMC Local Area Network. Those working the planning issues in AFMC Provisional HQ indicated that the decision to do several forms of integration was actually made early on when the provisional HQ was established.

5. Were pre-merger considerations made for the technology requirements of the merging organizations? If not, what considerations would have been helpful to the actual merger implementation activities? How?

One person said that a great deal of work was done in this area while all others said none, or very little, was conducted. All agreed, however, that a great deal more could have been done. If it had all agree that they would not have the incompatible systems present now.

Common Goals

1. Were there any stated organizational goals in the pre-merger organization?

The majority of respondents indicated that many goals were established for the overall merger by command leadership, and communicated throughout the command. There was no shortage of goals for the command in this regard, since AFMC was following Total Quality guidelines. Most importantly people were told, "You will get what you need to excel." Most respondents mentioned that IWSM was also touted as a goal with its "cradle to grave" philosophy. From an IS viewpoint, open systems were to be the standards to follow and that everyone would be on-line. According to respondents on the IM staffs, this came to be true for the most part at the HQ, but no command-wide integration and compatibility was discussed. The overall goal was to develop a "seamless" organization, although one respondent indicated that the common phrase was "Get it done, do it quickly." One interesting finding was one respondent's emphasis on Aeronautical Systems Division, under AFSC, and

how firmly this organization believed in training. When the commands merged, money became available to pay for upgraded training.

2. Are there any stated organizational goals for the new organization? If so, who made them?

The responses gathered indicated that the new command leadership originated the MEB and IWSM philosophies; those became the driving force behind what is now AFMC. While still a provisional headquarters, the provisional command leadership continued to focus on the AFMC goals which were written, and attempted to push this down to lower levels of the organization. The main information systems goal seemed to be to get everyone on-line and be able to communicate with each other.

3. Is there an organizational strategic plan? If so, does it address training for the changes brought about by the merger? Or personnel requirements brought about from the merger?

All respondents said yes; however, only one respondent could produce it. Apparently, the plan is going through some major changes right now, especially in regards to IM/CI/SC. Most were unaware of what it contained, including training and personnel issues.

4. If there was no consideration of the goals of the post-merger organizations, would they have been beneficial to the affected organizations? How?

All stated that some consideration was made, but that more would have been beneficial. It seems that people did not really understand what the goals that were made would really do for them in the future, thus there was some degree of confusion regarding the direction of the merger and the command.

Overall

1. Do you feel that the following five areas for merging information systems:

a. Organizational Structure

b. Information and Data Flows

c. Cultural Factors

d. Common Technologies

e. Common Goals

address appropriate considerations for such a merger?

All said yes, and further recommendations for additions and deletions will be addressed in Chapter V.

2. In your opinion, what is/are the most critical areas? What other areas would you add or delete?

Four respondents said that cultural factors were most important, while three said that Functional Process

Improvement, or whatever name is given a potential sixth area, was most important. One respondent didn't really add anything except that the model was "great." It was strongly suggested by many, including one of the top IM leaders in the new command, that FPI/BPI needs to be split out of Organizational Structure to a sixth level of the model.

3. Would an application of these five areas have assisted in your merger plans and activities?

Most said that the model would have helped, mostly as a guide or template of the areas to consider. One individual suggested that the model should be written to a greater level of detail. One of the integration leaders stated that the model would not have affected the AFMC plan, but that it would help future activities.

The last two questions were removed; they reflect recommendations and future possibilities. These questions will be in the conclusions and recommendations in Chapter V.

Chapter Summary

This chapter presented the re ses gathered from the interview sample at Air Force Materiel Command. Each of the aggregate model's elements was discussed from each of the interviewee's perspective. The aggregate model was presented as a series of separate topics which were then linked together for the interviewee as a cogent model. Once

the model was presented, the questions were directed towards a validation of the model's applicability and use for organizational information systems mergers.

Overview of Chapter V

The next chapter summarizes the research effort discussed in the previous four chapters. Conclusions and further discussions of analyses are then presented. Lastly, recommendations for future research in the area of information system mergers are offered.

V. Conclusions and Recommendations

Introduction

This chapter reviews the issues presented in the previous chapters and provides recommendations and conclusions for the investigative questions posed in Chapter I. A recap of the research presented in various chapters is provided in the form of investigative question analysis and implications, as well as conclusions, followed by recommended implementation guidelines. Finally, future research possibilities are suggested.

Issues Reviewed

The stated purpose of this study was to develop and test an aggregate theoretical model for use when integrating organizational MIS during the planning of organizational mergers. The first step in this study was to thoroughly investigate and integrate the relevant literature concerning the present models which have a bearing on mergers and information systems. With the completed review, the next step was to create an aggregate model which could generalize to the ongoing mergers within and without the Department of Defense. The significant elements within the present models, along with non-model parameters, were formed into a five-element aggregate model which would then be tested by a standing military organization. Once the aggregate model

was formed, a suitable organization to test it was located at the Air Force Materiel Command at Wright-Patterson Air Force Base, Ohio. Through a pre-test phase and final approval from the command Information Management community, the research was conducted through a personal interview format. The interview pool consisted of people who had been intimately involved in one form or another with the implementation of a command merger between Air Force Logistics Command and Air Force Systems Command. This involvement was either in information systems integration, or the Office Automation project which would link the headquarters through a new local area network system. Several of the respondents were members of the provisional command headquarters which had been established at Wright-Patterson to facilitate a smooth transition between commands.

Case Study Environment

Before discussing the research conclusions, the environment and some background on the Air Force Materiel Command merger is examined. This explanation provides a framework within which the conclusions can be better understood, and the recommendations more relevant.

The general environment between Air Force Systems Command, formerly headquartered at Andrews Air Force Base, Maryland, and Air Force Logistics Command formerly

headquartered at Wright-Patterson Air Force Base, Ohio, was quite dissimilar. As pointed out in previous chapters, the commands were fundamentally different in their approach to command structure and management philosophy due primarily to a difference in the business they conducted. Systems Command was a highly decentralized command whose primary function was to ensure leading edge research and development (R&D) was conducted, and proper weapons system acquisition was executed. Logistics Command was a highly centralized organization whose function was to provide support for base structure and logistics, as well as aircraft lifecycle maintenance through a system of depots located around the world. Although Logistics Command was arguably more geographically separated, having depots in California, Georgia, Oklahoma, Texas, Utah, and in several other countries, they stressed centralized decision making and control of overall management. Systems Command was not as substantially separated by distance. The command dealt with a myriad of different contractors and researchers for their R&D and acquisition roles. Each product center under the Air Force Systems Command, defined by examples such as the Aeronautical Systems Division at Wright-Patterson Air Force Base, and Electronic Systems Division at Hanscom Air Force Base, Massachusetts, was basically autonomous, responsible for their own projects and budgets. Within each of the product centers, several autonomous weapon System Program

Offices (SPOs) were in place to ensure all efforts for a given project or weapons system were coordinated and controlled. These offices each had budgetary control and virtual autonomy from the product center. All these factors combined to make the commands somewhat bipolar in their methods and policies, yet each supported the other by taking any individual Air Force system from design through acquisition to support to retirement; in other words, from cradle to grave.

What does this indicate for the information systems? Each command dealt with information systems in a different way. Logistics Command was using mainframe computer systems with many of the elements tied together so that centralized decision making was possible. Systems Command had several different systems which mainly operated on mini-computers and UNIX "boxes" as each office attempted to interface with their own contractor and customers, but not with the command headquarters. When presented with a number of differing information systems as part of an overall command merger, the people assigned to integrate these resources had a daunting task.

The overall command merger was a highly planned activity, and through the implementation of a provisional headquarters, the planning was coordinated. While planning an organizational merger is a well documented activity, planning an information systems merger is not. Therefore,

many of the individuals associated with this endeavor were highly frustrated in their efforts as they were charting new ground, and the element of parochialism which was evident in the functional areas within each command also stymied them. This will be highlighted in later discussions.

The command was integrated to bring together the various logistics and acquisition functions into one organization so that true "cradle to grave" management of weapons systems could be achieved. For information systems, this meant that a highly centralized system must exist at some level within the organization so that all the economies of scale for decision making can be brought to bear and be available to managers and planners throughout the command. However, the information systems managers trying to integrate these separate systems were not given adequate information about the value of each existing information system from the users present within each organization. For those systems with similar functions between the commands, the task was easy...they simply coordinated a replacement system from one of the existing systems. For example, in the finance arena, the two functional area leaders decided to use one system from a given command, then integrate the data necessary. Where offices were dissimilar between the commands, the systems were reviewed for applicability and a decision was made to either keep the present system or dispose of it in favor of a newer or better system.

Conclusions and Implications

The investigative questions from Chapter I form the basis for the research, and the following section. Relevant conclusions and insights are discussed for each investigative question.

Investigative Question One What is the aggregate model? What are the key perspectives and variables involved?

Each of the five area of the aggregate model and the non-model guidelines addressed specific, narrowly focused consideration elements with some overlap between models. The significant variables were extracted from each model as shown in Table 2.3. An aggregate list of those significant elements was formulated. Elements in that list included: Organizational Structure, Information and Data Flow, Cultural Factors, Common Technologies, and Common Goals. Table 5.1 shows the resultant aggregate model for merging information systems that was formulated from the literature before the case study of AFMC was initiated.

Table 5.1. Proposed Aggregate Model

1. Organizational Structure
2. Information and Data Flow
3. Cultural Factors
4. Common Technologies
5. Common Goals

None of the models or guidelines examined during the literature review specifically addressed all of those areas of consideration for merging information systems. As a result, critical elements deemed necessary to plan for such a merger were extracted from each individual model that resulted in the above synthesized model. In fact, no other existing model for information systems mergers was found in the literature search, or through interviews with subject matter experts in organizational mergers and information management.

Investigative Question Two To what extent did the case study organizations' experiences reflect the aggregate model?

As discussed in Chapters III and IV, a structured interview was administered to various key personnel assigned to the Air Force Materiel Command headquarters. Their responses to the personal interview served as the basis of Chapter IV. This small number of individuals all played key roles in the formulation and implementation of plans in the merger of Air Force Logistics Command and Air Force Systems Command, especially in regards to the various information systems that existed throughout the organizations.

Planning for each of the areas labeled by the aggregate model was conducted to some degree, although it was not structured to reflect the model itself. In other words, the provisional HQ did plan for merging their information

systems in each of these areas, at least on paper. Further analysis demonstrates that a great deal of the planning in some areas was cursory, particularly in Information and Data Flows and Common Technologies--this will be discussed in more detail shortly. These areas were often overlooked for reasons of time and effort involved. A thorough analysis of what users required in order to do their jobs was never really conducted, nor were pre-merger systems actually analyzed to establish standardized systems throughout the command. This was all part of the information needs analysis and data flow analysis which was only completed in a cursory manner.

Based on the interview responses, the AFMC merger activities reflect those consideration areas within the aggregate model. The rest of this discussion centers on the degree of congruency between model guidelines and AFMC merger experiences.

The first model guideline is Organizational Structure whose key goal was to look at how pre-merger organizations are structured, so that the post-merger organization will not waste resources on redundant systems and departments. When considering the cultural factors involved in the structure of the pre-merger organizations, survey question 1.2 asked "What organizational changes took place as a result of the merger? How did these changes affect your job?". To reiterate some of the responses, one respondent

indicated that the two commands finally got to see what the other had been doing and how they accomplish their mission. This led to a greater understanding of function and how the two commands could interoperate. This supports the guideline of organizational structure within the model since an analysis of how the old organizations do business, along with an understanding of what is going to be required in the new organization can lead to basic operational guidelines for both the organizations, and their information systems.

The next model guideline is Information and Data Flows which is the realization that once an analysis of the organizational structure is done, the next phase is to ensure that the information needs have been identified and are met at least as well as in the pre-merger organization, if not yielding some improvement. One of the guiding principles of this area is the planning involved in investigating and analyzing the baseline already established within the organization. As stated in Chapter IV, most of the respondents believed the coordination of a baseline analysis of information systems, information needs and data analysis was being completed by the functional representatives or leadership, and coordinated through one office; however, through further analysis, the indication was that this work was only being done in a cursory way with parochialism taking precedence over a thorough review of the real situation. In defense of those doing the actual

"data collection", their understanding of information and data analysis is limited since the emphasis on information and data as a corporate resource is relatively new--if one cannot understand what is expected within the analysis, it is difficult to gather the right information.

The third model guideline stresses identification and analysis of cultural factors. Combining this subject area with the previous paragraphs, if the information needs are met, and the organizational structure is well defined, then the users should be identified, and their needs met. One way to do this is to analyze their needs and determine what culture exists within the pre-merger organizations. To achieve synergy in the new organization, the goal is to meet or exceed the previous way business was done by combining the best of the pre-merger organization.

One respondent further indicated that the new command had established a new, improved research and development center for information management, but had underfunded the office. The respondent may have been indicating that the culture present within the new command might need to better understand the nature of information and its importance to the command mission. The AFMC experience was that some people management was done, however, a greater overall analysis of what the people needs were may have been appropriate.

The fourth area of consideration is the common technologies present within each organization. Organizations must understand the technical requirements necessary for separate information systems to communicate with one another. However, before this can be accomplished, the steps outlined above should be taken to ensure that

a. Systems themselves are identified

b. These systems match the needs of the organization

c. The systems are being used in the proper manner by the personnel within the organizations at least as effectively as pre-merger.

The responses gathered from AFMC personnel indicate that the fundamental difference in mission between the two former commands created what has been identified by some respondents as a difficult "marriage" of the two organizations. Since AFLC was a centralized organization with appropriate hardware and software to support that basic structure, and AFSC was a decentralized organization structured to support this organizational pattern, the systems were different. If the systems need to be aggregately more efficient in the new organization, these differences need to be understood and merged. Most of the responses indicate that some work has been done to promote this goal, but much more needs to be accomplished before the ideal of a truly seamless organization is met.

Finally, the last area in the model deals with the common goals within the organization. The members of the new organization must understand the direction of the new organization and how they fit into this direction. By establishing a common direction, merger organizers can plan for ways to overcome the problems that will arise within the previous four model guideline areas. Within AFMC, most individuals stated that they neither knew the organizational goals, nor how they fit into these goals. Apparently, although the new organization had goals which had been worked out by a committee at the highest levels, these goals were not widely known or understood within the organizations beneath the leadership, and the functional hierarchies. Without this understanding, the goals of the organization to create a seamless, improved information system is difficult to accomplish.

To complete the discussion of Investigative Question Two, a summary table was formulated to show the supporting comments for areas of the model. These comments come directly from the interview questionnaires, along with the number of people supporting one area of the model as "most critical." The order of the elements in the model presented in the table is consistent with the model earlier presented in Table 5.1., and Table 2.3. Although they are not presented in a ranked order, there is an apparent rank to the responses as four interviewees judged cultural factors

to be the most important with other elements indicated with their supporting responses. Common Technologies, arguably the easiest area to overcome using current emerging technologies was not rated as "most critical" by any respondent. The underlying reasons for this table, and the responses used to create the table will be discussed under the Additional Considerations portion of this chapter.

Table 5.2. Model Element Support Matrix

Common Elements	Supporting Comments
Organizational Structure	• Three interviewees indicated most critical (FPI portion) • "No site by site comparison" of functional areas • "The pre-merger organization at HQ AFSC/IM was functionally aligned with the Air Staff and the field, the post-merger organization was process oriented and did not align with either."
Information and Data Flow	• Two interviewees indicated most critical • "AFSC guys were fighting for their systems to be the systems of choice." • "(Information needs analysis was) not as effective as it could have been." • "(Data flows analysis was) supposed to be done, but not mandated. Not much, if any, was done."
Cultural Factors	• Four interviewees indicated most critical • "This was a shotgun marriage and it took time to settle down into a working environment conducive to teamwork." • "(Currently) personal (job) security is a major concern. IWSM causes people to work in different areas." • "My system, not invented here, we are unique, we have always done it this way, etc."
Common Technologies	• No interviewees indicated indicated most critical • "Get it done, do it quickly." • "(Pre-merger) we had them all (systems available), (post-merger) we still have them all." • "Would be surprised if it(cost analysis) occurred. 'No' was really used to limit systems."
Common Goals	• One interviewee indicated most critical • "Money was more of a driving force than goals/needs." • "(Strategic plan) done independently of functionals."

Investigative Question Three. What variables need to be added to/deleted from the aggregate model?

No variables from the aggregate model were recommended for deletion. However, one key area was brought up by several people that indicated that a clarification was

required of the model. In the original definition of Organizational Structure, an analysis of the functions and processes of the merging organizations was included. In this area, organizations would examine how they conducted business in the various sub-units of the organization in order to establish the actual information needs of the entire organization. These functions and processes represent the minimum requirements (critical success factors) that must be considered for the business entity to remain a viable unit. Without such analysis, the sub-units cannot define their own needs, let alone the needs of the overall organization. For without establishing what the organization needs in order to function, an information system that can address those needs cannot be developed.

Based on the recommendations of several interviewees, this area should be considered separately from the Organizational Structure element and given its own place within the model in order to establish its importance to the overall considerations for merging information systems. In recent years, authors and management scientists have labeled such efforts "Business Process Improvement", or "Business Reengineering". In the DoD, the label is "Functional Process Improvement (FPI)." Table 5.3. represents the new aggregate model once this final guideline, Functional Process Improvement has been added.

Table 5.3. Proposed Aggregate Model--Post-Interview

1. Organizational Structure
2. Functional Process Improvement
3. Information and Data Flow
4. Cultural Factors
5. Common Technologies
6. Common Goals

Investigative Question Four. What lessons have the organizations learned during their merger efforts which would have future impact?

- "Tell people what is really going on."
- "Set standards and stick to them."
- "Give people the time and resources they need to do what you are asking of them."
- "Make people accountable for their actions."
- "Prioritize."
- "Gain more change agents."
- "Get the word out better."
- "Motivate the management."

These are quotes from various interviewees as expressed from the structured interviews. They generally seemed to relate to personnel issues, an interesting point from the standpoint of the research as Cultural Factors was deemed the most important element of the model for consideration by the most parties. These AFMC leaders (interviewees) felt

that if the people side of the information systems were better informed, prepared, and resourced for the overall merger that an information system developed to support the needs of the organization. The people doing the job best understand and are capable of ensuring the best/most suitable system for their use.

Additional Considerations

The overall model is analyzed in relation to other relevant variables which concern the environment in which the case study and interviews were conducted. As stated in Chapter IV, no two mergers are alike. The environmental areas to be examined in this section are the nature of the pre-merger and post-merger organizations and how this affects the interviews; the amount of time the command had to plan for and execute the merger of information systems, as well as the overall command merger; the divergent missions within the organizations and how these missions were never fully analyzed and integrated; and how the external environment (personnel drawdowns, resource reductions, etc.) affected the merger.

The first consideration area is the way in which the case study was conducted in a post-merger environment as opposed to a pre-merger environment. The ability to ascertain post hoc the efforts of the organization allowed the respondents to see what had been done and reflect upon

what could have been done better. Obviously, in a pre-merger environment, this analysis is not possible. Without an information systems benchmark against which to measure, the respondents would not have had a basis for consideration when they were asked what effects a given model guideline would have upon an impending merger--there was no basis of comparison to a similar merger activity. Their answers may be biased by the lessons they learned from having participated in the merger. The advantage of a pre-merger case study would be the application of the theory against the actual implementation. The experience shown by doing a case study in a post-merger environment provides insight that a pre-merger test of the refined model may be in order. This would enable future researchers to apply the model in a different context and further refine it. This point is discussed again in the recommendations for future research section of this chapter.

While discussing pre- and post-merger organizations, it is important to mention the nature of the organizations themselves and how a merger affected them. As has been stated before, there seemed to be two diametrically opposed organizations in terms of mission and management philosophy which were attempting to merge. AFLC was a centralized organization in terms of its management and control, yet geographically separated. For information systems, this meant that they used a mainframe environment with

workstations which could feed information to the central repository. AFSC was a decentralized organization where SPOs worked closely with industry and built their information systems to reflect this partnership. This created nightmares for a systems planner trying to bring such diverse technologies and cultures together--a huge undertaking without using the benefits of a structured planning methodology.

The second consideration within the analysis of the findings is the amount of time the respondents and their co-workers had to plan for the merger. Quite simply, the amount of time available for merger planners was very limited. Because there was no previous knowledge to draw upon, there was no way for them to estimate how long such an effort would take. The organizations had no idea of the time involved to integrate all the various functions throughout the command. Since leadership announced such a limited time frame (18 months) for the analysis, integration, execution, and completion of the merger, the information systems planning was severely constrained. Even if a plan and model had been in place, there still was not enough time to do everything which this research has shown to be necessary, or at least considered.

The third area of consideration, probably the most important, is the divergent missions which existed between the organizations. AFLC and AFSC each performed tasks that

were parts of the overall logistics and acquisition functions of the Air Force. These tasks were very different from one another, AFLC dealt with the centralized control of systems support after they were acquired, AFSC only dealt with the research, development, and acquisition of products. Once AFLC assumed management of a system, AFSC relinquished all responsibility for it to AFLC--there was no consistent management from "cradle to grave". One of the main reasons for the merger of AFLC and AFSC was to make this "cradle to grave" management a reality. The name given to the philosophy was IWSM. With rare exception (personnel, financial, and other USAF standard functions), the previous AFLC and AFSC command-specific functional communities, under the guise of AFMC, continue to do what they have always done, the same ways they have always done them, using the same diverse systems they have always used. In effect, the merger of these activities and their supporting information systems only took place at the headquarters level. This produced only limited accessibility to the actual information command decision-makers need on a daily basis. For instance, as noted earlier, electronic mail connectivity does not exists across the command because of the disparate systems in place. For IWSM to work, a thorough analysis and integration of information systems is required.

Finally, several external environmental issues affected this merger. These issues were beyond the control of merger planners and command leadership as they are specific to the DoD and USAF and not the command itself. Issues such as DMRD-918 and-924, manpower level reductions, reductions in force (RIF), early retirements, hiring freezes, and even where the command headquarters would be located all affected the merger as a whole. For information systems, the impact came when corporate knowledge and history were lost as people left the command for these reasons. For example, if a senior level civilian leader elected to stay in the Washington DC area, their expertise was lost to the newly formed AFMC. Since integrated systems had not been coordinated and implemented, no repository existed for this information and expertise. In effect, this left voids in the overall information systems of the command.

In Chapter I of the thesis, several points were discussed which demonstrate the reason this research and why the aggregate model may be necessary. One of the salient points made was that a company formulates a corporate strategy and then writes a strategic plan to reflect the corporate operational philosophy. As Zwass points out, an organization that intends to succeed will need to be rooted in a firm, overall strategic plan (Zwass, 1992: 418-20). Other authors then indicate that information and information systems may serve to link the strategic plan to a plan of

action or business plan. Thus, it may be beneficial for information systems planners to take part in the development of the organizational strategic plan for any organization, but especially for those organizations considering or implementing a merger. In the case of AFLC and AFSC, each had formulated a rough strategic plan based on Total Quality initiatives and intended to follow this through once the commands merged. In the implementation, the command seemed to have trouble formulating one corporate strategy which each functional area of the command could follow. This seems to be a weakness in planning which is one of the more difficult areas to overcome when trying to merge two entities which had differing and divergent missions. All the consideration elements mentioned above seem to stem from a desire to complete the integration of the two commands as quickly as possible and work the details later.

The analogy of an iceberg used in some management and organizational behavior texts comes into play. As organizations attempt to merge, they seem to be competent at addressing many of the easily seen areas such as integration of technologies and moving offices, but the underlying issues, most of which deal with the culture and people issues, dwell beneath the visible surface, and can be larger than many planners and leaders estimate and are sometimes the hardest elements to overcome. It is little wonder that the participants in the merger observed that Common

Technologies was not a "most critical" area as discussed above, while Cultural Factors, those things beneath the surface, was rated "most critical" by the highest number of respondents.

Throughout this thesis, a merger of information systems has been stressed as part of a larger organizational merger. In corporate America, organizations merge which have some common bond or goal, and in most cases, the same corporate mission. In the case of Bank One, they merge with other banks. On one level, two Air Force major commands merging could be construed as analogous. The merger of Strategic Air Command into Military Airlift Command and Tactical Air Command brought about two new commands with essentially the same mission, fly aircraft. However, AFLC and AFSC may have had less commonalty on which to build. This fact still appears as major obstacle to overcome.

Another consideration is that each individual command and even some individual bases have their own unique information systems in place to do their work. As the commonalty suffers, so does the degree to which a merger of these systems will be successful.

Future Research

First, a further study of the model and refinement is necessary to put concrete steps into the model, such as FPI, which could be used by an organization to actually conduct

an information systems merger resulting from an organizational merger.

That leads to the next step, further testing and validation of the model by using it as a template against an ongoing merger, or a merger which is in the planning stages. The model has been tested in a post-merger environment, but by using the model during an actual merger, the correct mix of elements and some of the tools which would enhance the model could be formulated.

Appendix 1: Questionnaire

Interview Questionnaire

Name:_____ Civ:_____ Mil:_____

Phone:_____

E-Mail:_____

Organization:_____

Pre-merger organization:_____

Pre-merger job title:_____

Post-merger:_____

General Job Description:

Did you personally participate in the merger of the two organizations?

If so, how? Planning or implementation?

Organizational Structure

1. What was the organizational structure prior to the merger (i.e. chain of command, process or function oriented, etc.)?

2. What organizational changes took place as a result of the merger? How did those changes affect your job (i.e. personally, information systems, etc.)?

3. What benefits/problems did the structure of the pre-merger organization have over the current structure?

Information and Data Flow

1. If "information needs" are defined as that information necessary to get your job done, was any organizational identification of information needs accomplished before the merger took place? If yes, what types of identification took place?

2. "Data flows" are ways information and data gets from you to those people, offices, or organizations you interact with, along with the data actually needed to get the job done. Was any analysis of this data flow done within either the pre- or post-merger organization? If yes, what sort of analysis was conducted?

3. How much information and information system user involvement took place during the pre-merger activities? Were users consulted about their requirements within the new organization?

4. If no information relationship definition and/or data flow analysis was conducted, would such information have been useful for the actual merger implementation? How?

Cultural Factors

1. What is your assessment of the current cultural climate? What are the important workplace norms and values?

2. What organizational cultural changes occurred as a result of the merger and its related activities?

3. Were any particular personnel concerns addressed as part of the pre-merger activities? (i.e. were any meetings or briefings held for the effected employees/users?)

4. How would you personally assess the pre-merger levels of resistance to change within the pre-merger organizations? During the merger itself? Post-merger?

4a. At what level was leadership involved in the merger activities?

5. At what level were decisions concerning pre-merger activities made and who made those decisions? How were the merger decision details disseminated?

6. If no consideration was given to the cultural climate prior to the merger, what effect do you believe would have occurred with such consideration?

Common Technologies

1. What were the major hardware/software systems in place prior to the merger, and which systems were changed as a result of the merger?

2. At what point in the merging process were compatibility factors addressed? Who established the technology standards for the merged organization?
3. Was a hardware and software cost analysis for merging the information systems conducted? By whom? Results?

4. What level of integration was decided upon between the pre-merger organizations? (full integration, partial, independent systems, or incompatible systems)

5. Were pre-merger considerations made for the technology requirements of the merging organizations? If not, what considerations would have been helpful to the actual merger implementation activities? How?

Common Goals

1. Were there any stated organizational goals in the pre-merger organization?

2. Are there any stated organizational goals for the new organization? If so, who made them?

3. Is there an organizational strategic plan? If so, does it address training for the changes brought about by the merger? Or personnel requirements brought about from the merger?

4. If there was no consideration of the goals of the post-merger organizations, would they have been beneficial to the affected organizations? How?

Overall

1. Do you feel that the following five areas for merging information systems:

a. Organizational Structure

b. Information and Data Flows

c. Cultural Factors

d. Common Technologies

e. Common Goals

address appropriate considerations for such a merger?

2. In your opinion, what is/are the most critical areas? What other areas would you add or delete?

3. Would an application of these five areas have assisted in your merger plans and activities?

4. What are your additional recommendations?

5. What are the lessons you or the organization learned from the merger and its related activities, particularly in relation to the information systems?

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Vita

Captain John A. Ellis was born on 23 September 1963 in Aurora, Illinois. He graduated from Hinton High School in Hinton, West Virginia in 1981 and attended Marshall University in Huntington, West Virginia, graduating with a Bachelor of Business Administration in Management in May 1985. Upon graduation, he received a regular commission in the United States Army. After attending the Field Artillery Officers' Basic Course at Ft. Sill, Oklahoma, he served his first duty assignment with the 24th Infantry Division (Mechanized), Ft. Stewart, Georgia from December 1985 until February 1988. While assigned to Ft. Stewart he served as a Company Fire Support Officer, the Battalion Reconnaissance and Survey Officer, and the Battalion Logistics Officer (S4). In February 1988, he returned to Ft. Sill for the Field Artillery Officers' Advanced Course. From October 1988 to September 1991, he was assigned to the 1st Armored Division, Zirndorf,FRG where he served as the Battalion Logistics Officer and the Service Battery Commander. Prior to his entry into the Army Acquisition Corps and selection for the Advanced Civil Schooling program and AFIT attendance, Captain Ellis taught Army ROTC at Michigan Technological University, Houghton, Michigan from October 1991 until May 1993.

John A. Ellis
Box 329
Summersville, WV 26651

Captain Matthew T. Pirko was born on 4 September 1966, in Havre de Grace, Maryland. He graduated from John Carroll High School in Bel Air, Maryland in 1984 and attended Randolph-Macon College in Ashland, Virginia, graduating with a Bachelor of Arts in Political Science in May 1987. In March of 1989, he started Officers Training School at Lackland Air Force Base, Texas, graduating on 22 June 1989. After attendance at the Basic Information Management Officers' Course at Keesler Air Force Base, Mississippi, he was assigned to Wright-Patterson Air Force Base, Ohio, and the 4950th Test Wing in August of 1989. He served as Executive Officer to the 4950th Organizational Maintenance Squadron, the 4950th Avionics Maintenance Squadron and the Deputy Commander for Maintenance before accepting an assignment to Yokota Air Base, Japan, in August of 1991. While stationed at Yokota, he served as Squadron Section Commander to the 475th Supply Squadron, and the 374th Operations Support Squadron, and was chosen to be the Protocol Officer for the 374th Airlift Wing and eventually Fifth Air Force. In March, 1993, he was selected to attend the Air Force Institute of Technology in-residence Masters degree program at Wright-Patterson Air Force Base, Ohio, and reported in May, 1993.

Matthew T. Pirko
19771 SW 85th Loop
Dunnellon, FL 34432

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As the Department of Defense continues to shrink, "downsizing" and "rightsizing" are terms that often indicate that changes are inevitable to many military units and organizations, some of these changes result in organizational mergers. One of the critical areas for such mergers lies within getting the information systems of the pre-merger organizations to work together. This thesis presents a model for merging information systems as part of an organizational merger. The proposed model, synthesized from existing technical and non-technical models and guidelines, addresses five key areas for consideration for a successful information systems merger. Those areas are: (1) Organizational Structure, (2) Information and Data Flow, (3) Cultural Factors, (4) Common Technologies, and (5) Common Goals.

A case study of the Air Force Materiel Command merger was examined to test the model and to comment on the results of their efforts for future merger activities.

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